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July 30, 2003

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

EX PARTE NOTICE

Re: Permitted Ex Parte Presentations on the Biennial Regulatory Review – Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, IB Docket No. 00-248

Dear Secretary Dortch:

On September 5, 2003, Jan A. King, a consultant to QUALCOMM, Inc., communicated telephonically and by e-mail with Andre Rausch of the Federal Communications Commission to discuss QUALCOMM's comments and reply comments in the above-referenced rulemaking proceeding.

During these communications QUALCOMM provided additional information concerning its proposed revisions to the Part 25 rules. Attached is a summary of the information provided during these presentations.

Please let me know if there are any questions concerning this matter.

Sincerely yours,

Leslie A. Taylor

Cc: Thomas Tycz, Chief, Satellite Division
John Martin, Senior Engineer, Satellite Division
Steven Spaeth, Policy Branch
Andre Rausch

Summary of Points Regarding the Use of a Statistical Rule to Govern Adjacent Satellite Interference in the 20/30 GHz Band

This discussion amplified a number of points which had been previously mentioned by Leonard Schiff, QUALCOMM, during QUALCOMM's meeting with Commission staff on July 29, 2003. The following summarizes these additional points.

(1) How an earth station applicant would demonstrate compliance with the QUALCOMM proposed statistical regulation concerning adjacent satellite interference.

The first is a paper showing. This is the same type of showing that an applicant would have to make in seeking a waiver of the current rules. The second is that [an applicant] just checks the new box on the application that says, "yes, I meet the adjacent satellite emission requirement". This is essentially the current procedure, e.g,. a promise that the operator will conform to the rule.

(2) The QUALCOMM statistical approach actually goes further than [is currently required] to demonstrate acceptable levels into adjacent satellites. The QUALCOMM system, for proper operation, depends on monitoring the power in each channel to make sure it doesn't get too high. The motivation for such monitoring is because [overall] performance suffers if [the power in each channel] gets too high. So, one approach would be to log these power readings and keep such a log for N months of operation. This would demonstrate compliance because if we know the statistical distribution of power from antennas which meet the required sidelobe performance, we can show that the system meets the adjacent satellite interference requirements. This log would be open to inspection by the FCC at any time and to complainants. This is much better "proof" of compliance than current operators are required to provide under the existing rules.

(3) It is important to take into consideration statistical distribution of transmissions when calculating interference. The fact of the matter is, the world is not getting less mathematical as we go forward but, more so. One could expect that this would begin to be encompassed in the regulations for these complex systems. In the case of the earth station under development, QUALCOMM is doing everything it possibly can to balance system capacity against adjacent system interference. Both of these parameters, when properly adjusted, optimize the utilization of the available spectrum. Achieving this balance in the broadband world clearly involves a signal ensemble that is statistically distributed in power, time and spectrum. So, one should expect statistically based criteria to ultimately appear in regulations designed to achieve this balance.

(4) With regard to the QUALCOMM system under development, we can be a little more specific. We have [two different types of] channels-- Random Access and Reservation:

Random Access Channel [These are few in number (approx. 2/beam)]:

The distribution is binomial with a large number of users and so [these

channels are] essentially Gaussian [distributed in power]. In the worse case there would be 10,000 users contending for this channel yet only an average of 30 at any one time are actually on. So the probability of being active is p=30/10,000. The standard deviation of the number of users is (NpQ)^.5, where N = 10,000, p=30/10000 and q=1-p. Therefore, the standard deviation is approximately the square root of 30 or about 5.5. So the average number of users is about 30 and the 3 sigma (99.9%) value is about 30+3(5.5)=46.5. The power into the adjacent satellite is proportional to the number of users. So the average power into the adjacent satellite is 30/46.5 of the 99.9 % value we suggested (about 1.9 dB down).

Reservation Channel [Larger in Number (approx. 20/beam)]:

Here we can't be as specific. We know the power that the user of each Walsh code is given and if all Walsh code users transmitted 100% of the time we'd know the power deterministically. But we know that many users won't use the channel they've been given that way. By some estimates they would use the channel in some modes only one-third of the time. So, treating this in a non-statistical way would be a terrible waste of spectrum. But we can't be quantitative until we actually observe the distribution.

The important thing is that QUALCOMM could [tolerate] almost any statistically based interference limit. But a hard 100% limit makes operation of a reservation channel impossible and the reservation channels spectrally inefficient.